START

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ENGINEERING CHANGE NOTICE

1. ECN 196702

Proj. ECN

2. ECN Category (mark one) Supplemental [ ] Direct Revision [x] Change ECN [ ] Temporary [ ] Standby [ ] Supersedure [ ] Cancel/Void [ ]	3. Originator's Name, Organization, MSIN, and Telephone No. R. R. Lehrschall, Environmental Restoration Safety Support, H4-67, 376-6788	4. Date
	5. Project Title/No./Work Order No. Activities Involving Drilling and Sampling of Contaminated Soils (Vol.1)	6. Bldg./Sys./Fac. No. Hanford Site
		7. Impact Level 2 ESQ
	8. Document Numbers Changed by this ECN (includes sheet no. and rev.) WHC-SD-EN-SAD-016, ~~Rev. 0, 0-A~~, 0-B	9. Related ECN No(s). N/A
		10. Related PO No. N/A

11a. Modification Work	11b. Work Package No.	11c. Modification Work Complete	11d. Restored to Original Condition (Temp. or Standby ECN only)
[ ] Yes (fill out Blk. 11b) [X] No (NA Blks. 11b, 11c, 11d)	N/A	N/A Cog. Engineer Signature & Date	N/A Cog. Engineer Signature & Date

12. Description of Change

The standard size of the drive barrels has been changed to include drive barrels of equivalent volume.

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13a. Justification (mark one)			
Criteria Change [ ]	Design Improvement [ ]	Environmental [x]	
As-Found [ ]	Facilitate Const. [ ]	Const. Error/Omission [ ]	Design Error/Omission [ ]

13b. Justification Details

Changes were made to include drive barrels of equivalent volume.

14. Distribution (include name, MSIN, and no. of copies)

See attached distribution sheet.

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A-7900-013-2 (06/92) GEF095

A-7900-013-1 (06/92)

ENGINEERING CHANGE NOTICE

1. ECN (use no. from pg. 1): 196702

15. Design Verification Required	16. Cost Impact				17. Schedule Impact (days)	
	ENGINEERING		CONSTRUCTION			
[] Yes	Additional	[] $	Additional	[] $	Improvement	[]
[X] No	Savings	[] $	Savings	[] $	Delay	[]

18. Change Impact Review: Indicate the related documents (other than the engineering documents identified on Side 1) that will be affected by the change described in Block 12. Enter the affected document number in Block 19.

SDD/DD	[]	Seismic/Stress Analysis	[]	Tank Calibration Manual	[]
Functional Design Criteria	[]	Stress/Design Report	[]	Health Physics Procedure	[]
Operating Specification	[]	Interface Control Drawing	[]	Spares Multiple Unit Listing	[]
Criticality Specification	[]	Calibration Procedure	[]	Test Procedures/Specification	[]
Conceptual Design Report	[]	Installation Procedure	[]	Component Index	[]
Equipment Spec.	[]	Maintenance Procedure	[]	ASME Coded Item	[]
Const. Spec.	[]	Engineering Procedure	[]	Human Factor Consideration	[]
Procurement Spec.	[]	Operating Instruction	[]	Computer Software	[]
Vendor Information	[]	Operating Procedure	[]	Electric Circuit Schedule	[]
OM Manual	[]	Operational Safety Requirement	[]	ICRS Procedure	[]
FSAR/SAR	[]	IEFD Drawing	[]	Process Control Manual/Plan	[]
Safety Equipment List	[]	Cell Arrangement Drawing	[]	Process Flow Chart	[]
Radiation Work Permit	[]	Essential Material Specification	[]	Purchase Requisition	[]
Environmental Impact Statement	[]	Fac. Proc. Samp. Schedule	[]		[]
Environmental Report	[]	Inspection Plan	[]		[]
Environmental Permit	[]	Inventory Adjustment Request	[]		[]

19. Other Affected Documents: (NOTE: Documents listed below will not be revised by this ECN.) Signatures below indicate that the signing organization has been notified of other affected documents listed below.

Document Number/Revision	Document Number/Revision	Document Number Revision
WHC-SD-EN-SAD-016, Vol. 1, Rev. 0, 0-A, 0-B		

20. Approvals

Signature	Date	Signature	Date
OPERATIONS AND ENGINEERING		ARCHITECT-ENGINEER	
Cog Engineer M. J. Galgoul	8/24/93	PE	
Cog. Mgr. R. A. Carlson	8/24/93	QA	
QA T. L. Bennington	8/24/93	Safety	
Safety K. A. Smith	8/23/93	Design	
Security N/A		Environ.	
Environ. K. A. Gano	8/19/93	Other	
Projects/Programs N/A			
Tank Waste Remediation System N/A			
Facilities Operations N/A		DEPARTMENT OF ENERGY	
Restoration & Remediation N/A		Signature or Letter No.	
Operations & Support Services			
IRM N/A		ADDITIONAL	
Other ERSS N. R. Kerr	MK		
RRSA J. J. Zimmer	8/24/93		

SUPPORTING DOCUMENT

1. Total Pages 290

2. Title

Title: Safety Assessment for Environmental Investigations and Site Characterizations Vol. 1: Activities Involving Drilling and Sampling of Contaminated Soils

3. Number

WHC-SD-EN-SAD-016, Vol. 1

4. Rev No.

0-C

5. Key Words

Characterization Activities
Safety Assessment
Vadose Zone Soils

APPROVED FOR PUBLIC RELEASE. 8/31/93 V. Soles

6. Author

Name: R. R. Lehrschall

R R Lehrschall
Signature

Organization/Charge Code 29550/HIBBE

7. Abstract

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9. Impact Level 2 ESQ

10. RELEASE STAMP

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9313516.0

RECORD OF REVISION

(1) Document Number: WHC-SD-EN-SAD-016, Vol. 1

(2) Title

Main Title: Safety Assessment for Environmental Investigations and Site Characterizations

Volume 1: Activities Involving Drilling and Sampling of Contaminated Soils

CHANGE CONTROL RECORD

(3) Revision	(4) Description of Change - Replace, Add, and Delete Pages	Authorized for Release	
		(5) Cog. Engr.	(6) Cog. Mgr. Date
0-A	(7) Replace page 47 with new Prudent Action number 14: Monitoring for flammable gases should be in compliance with requirements in the operating specification document for watch list tanks.	J. R. Freeman-Pollard (signature on file 10/23/92)	R. A. Carlson (signature on file 10/23/92)
0-A	Replace page 49; text moved.		
	Rev. 0 released per EDT 160035 Rev. 0-A released per ECN 18144 Rev. 0-B released per ECN 189908 Rev. 0-C released per ECN 196702		
0-B	Revisions have been made to pages 3, 4, 21, 41, 42, 43, 44, 45, 46, 47, 48, and 49. These changes have been made to allow the use of a small quantity of liquid to be used in sample preparation in glove boxes in two trailers. The second change is to operational safety limit one; this change provides a limit on the surface radioactivity for alpha on the drive barrel and split spoon sample tools.	M. J. Galgoul (signature on file)	R. A. Carlson (signature on file)
0-C RS	One change has been made to page 38 to include drive barrels of equivalent volume.	M. J. Galgoul for 3/24/93	R. A. Carlson 3/24/93

9313614.1

4.4 ASSESSMENT SUMMARY

4.4.1 Assessment of Health and Safety Hazards

The potential hazards and mechanisms available that could result in consequences to the site worker, onsite worker, and the public were evaluated and are discussed in this section.

Based upon the assumptions in the analysis, the worst case consequences to the site worker were found to be exposures to air concentrations slightly above the DAC limit for ^{90}Sr and ^{239}Pu. External exposures appear to be a greater hazard than internal exposures. Controlling internal and external exposures to radiological hazards through good radiation protection practices would assure that occupational limits are not exceeded. Controls are established in Section 5.0 providing recommendations for controlling potential airborne releases and exposures to radioactive materials.

A worst case release event involving the maximum concentrations of radionuclides in three drive barrels has shown that consequences to the onsite worker and the public individuals to be negligible (magnitudes below the lower limits for a low hazard activity). The analysis also evaluated the consequences to the onsite worker at various distances to determine the appropriate boundary for establishment of a zone of control. Based upon the conclusions, it was found that a release due to dispersing the contents of three drive barrels would result in consequences below the limits for a low hazard operation at 10 m (33 ft) from the well site. The exposures expected at 10 m (33 ft) due to an accident would be no greater than 2.88 Rem/h which is below the 5.0 Rem for the onsite worker. The controls to assure consequences to the onsite worker and the public are ALARA require survey and monitoring to limit the measured dose rates of the extracted soils in a drive barrel that will assure integrity of the assessment conclusions. These controls are discussed in Section 5.0.

The maximum inventory of soil materials yielding the highest anticipated exposures was found to be three standard 25 cm (10 in.) drive barrels (actual dimensions 22 cm [8 5/8 in.] inside dia) or drive barrels of equivalent volume. Other smaller sizes of borehole tools were assessed in this analysis to determine potential radiation exposures that may be encountered as a result of the total volumes of contaminated soils removed from the boreholes.

For site worker considerations the estimated external dose rates for the soil characterization activities are identified in Attachment E. These exposure estimates address the highest anticipated radiation exposures that will be encountered by the site worker during these activities. The principal radiation sources are based upon the different configurations of the borehole tools containing maximum volumes of soil, the glove box containing a fully loaded split-spoon sampler, soil sample bottles with maximum volumes of soil, and an evaluation of exposures (based upon different volumes) associated with a waste drum.

A field source check was made of the sample glove box using a cobalt-60 source for determining the possible radiation exposure reduction based upon 1.2 cm (1/2 in.) lead glass shielding and lead impregnated gloves. The readings appear to indicate that the lead glass provides a dose reduction factor of approximately 3 on contact through the lead glass. With the source

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WHC-SD-EN-SAD-016, Vol. 1, Rev. 0-C

List attachments.

Date Release Required
August 23, 1993

Title Safety Assessment for Environmental Investigations and Site Characterizations
Volume 1: Activities Involving Drilling and Sampling of Contaminated Soil

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Patent - General Counsel	[]	[x]	OGC Memo 2/4/93 H. E. Marquez	H.E. Marquez	8/17/93
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R. R. Lehrschall NRK for RRLehrschall 8/18/93

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N. R. Kerr NRKerr 8/18/93

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APPROVED FOR RELEASE NG 8/31/93

Date Cancelled

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DISTRIBUTION SHEET

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Distribution	R. R. Lehrschall	Date August 19, 1993
Project Title/Work Order Safety Assessment for Environmental Investigations and Site Characterizations Volume 1: Activities Involving Drilling and Sampling of Contaminated Soils, Rev. 0-C		EDT No. ECN No. 196702

Name	MSIN	Text With All Attach.	Text Only	Attach. / Appendix Only	EDT/ECN Only
T. L. Bennington	H4-16		X		
M. D. Campbell	S3-90		X		
R. A. Carlson	H6-03		X		
J. A. Charboneau	S3-10		X		
L. P. Diediker	T1-30		X		
K. A. Gano	X0-21		X		
J. R. Freeman-Pollard	H6-03		X		
M. J. Galgoul	H6-03		X		
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